REMR MATERIAL DATA SHEET CM-WA-1.1

HIGH-RANGE WATER REDUCING ADMIXTURE FOR CONCRETE: CFR-2

1. NAME

CFR-2
High-Range
Water-Reducing
Admixture

2. MANUFACTURER

Halliburton Cementing Services
Duncan, OK

3. DESCRIPTION

CFR-2 is a sulfonated naphthalene formaldehyde in powder form.

4. APPLICABLE SPECIFICATIONS

Civil Works Guide Specification for Concrete, CW-03305.

ASTM C 494-82, "Standard Specification for Chemical Admixtures for Concrete."

5. USES & LIMITATIONS

Uses: CFR-2 is advertised primarily as a friction reducer for grouting applications. However, it can also be used as either a water-reducing admixture or a plasticizing admixture for concrete. The manufacturer states that it can be used:

a. As a Type A admixture to increase strength through water reduction and/or increase slump to facilitate placement or finishing.

b. To restore slump at the jobsite without adding water.

c. To offset the effects of clay or silt contamination.

d. To formulate high-strength, high-slump mixtures for high-rebar sections, pumping, and tremie applications.

e. To formulate super-strength concretes with very low water ratios.

f. To promote better compaction and increase strength for zero-slump precasting mixtures, including brick mixtures.

g. As a fluidizer and water loss control agent for pumpable grout mixes.

h. As a dusting or spray finishing aid.

i. In shotcrete or Gunnite mixes to increase strength, decrease rebound, or increase aggregate ratio.

Limitations: CFR-2 should not be used in excess of the manufacturer's recommendations. The results may be excessive retardation or segregation of the mixture.

6. MANUFACTURER'S TECHNICAL DATA

Packaging: 5 to 100 lb bags

Mechanical & Physical Properties:

Compressive str, min, % of control	
3-day	110
7-day	110
28-day	110
6-month	100
1-year	100
Flexural str, min, % control	
3-day	100
7-day	100
28-day	100
Length change, max shrinkage	
% of control	135
Increase over control	0.010
Relative durability factor, min	80
Color	light tan

7. MANUFACTURER'S GUIDANCE FOR APPLICATION

The recommended dosage is up to 1 percent by weight of cement, depending on the flow desired.

8. CORPS OF ENGINEERS' EVALUATION

CFR-2 was used in a study by the Waterways Experiment Station to retard the set of concrete placed underwater to allow for extended movement and better bonding. The results are published in Technical Report C-76-3, "Evaluation of Admixtures for Use in Concrete to be Placed Underwater." Based on the results of the investigation, the following conclusions are believed warranted:

a. Use of CFR-2 did not increase the flowability of equal-slump concrete, regardless of the point of tremie discharge.

b. Use of CFR-2 did not affect the slope significantly, regardless of the point of tremie discharge.

c. The concrete containing CFR-2 appeared to be more cohesive and developed less laitance than equal-slump concrete without this admixture.

9. ENVIRONMENTAL CONSIDERATIONS

Reasonable caution should guide the preparation, repair, and cleanup phases of concrete or mortar repair activities involving potentially hazardous and toxic chemical substances. Manufacturer's recommendations to protect occupational health and environmental quality should be carefully followed. Material safety data sheets should be obtained from the manufacturers of such materials. In cases in which the effects of a chemical substance on occupational health or environmental quality are unknown, chemical substances should be treated as potentially hazardous toxic materials.

10. AVAILABILITY & COSTS

Availability: This material is available throughout the US through a network of local distributors.

Costs: Approximately $3.00 per pound.

11. TECHNICAL SERVICES

A national network of applicators approved by the manufacturer offers field services, assistance, and related information.